

### Claims

Sub A' 7

1. A method for processing storage data that is to be communicated over a network, comprising:
  - providing storage data to be transmitted over a network;
  - serializing the storage data using storage encapsulation protocol headers to generate serialized storage data;
  - encapsulating the serialized storage data using a simple transport protocol to generate simple transport protocol data segments of the storage data; and
  - encapsulating each of the simple transport protocol data segments into Ethernet frames.

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encapsulation

2. A method for processing storage data that is to be communicated over a network as recited in claim 1, wherein the serializing of the storage data using storage encapsulation protocol headers to generate serialized storage data includes:

15 receiving the storage data, the storage data including one or both of commands and data, the commands including write commands, read commands, control commands, and status commands;

selecting portions of the received storage data to be serialized, the selected portions including commands and data; and

20 appending storage encapsulation protocol headers to each of the selected portions.

3. A method for processing storage data that is to be communicated over a network as recited in claim 1, wherein the encapsulating of the serialized storage data using a simple transport protocol to generate simple transport protocol data segments of the storage data includes:

5 selecting portions of the serialized storage data; and

appending simple transport protocol headers to the selected portions to generate the simple transport protocol data segments of the storage data.

4. A method for processing storage data that is to be communicated over a  
10 network as recited in claim 1, wherein the encapsulating of each of the simple transport protocol data segments into Ethernet packets includes:

generating media access controller (MAC) header;

appending the simple transport protocol segments to the MAC header; and

appending a cyclic redundancy check (CRC) to the simple transport protocol

15 segments.

5. A method for processing storage data that is to be communicated over a network as recited in claim 3, wherein the simple transport protocol headers each include at least a handle field, a type field, a length field, a sequence number field, and an  
20 acknowledgment field.

6. A method for processing storage data that is to be communicated over a network as recited in claim 5, wherein the handle field is used to exchange a handle during the commencement of a session, the handle being exchanged between a initiator and a target of the network.

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7. A method for processing storage data that is to be communicated over a network as recited in claim 5, wherein the sequence number field is configured to count Ethernet frames.

10 8. A method for processing storage data that is to be communicated over a network as recited in claim 5, wherein the acknowledgment field is used to exchange positive and negative acknowledgments of transactions.

15 9. A method for processing storage data that is to be communicated over a network as recited in claim 1, wherein the storage encapsulation protocol contains a tag so that data segments and data segments of the storage data can be matched to a correct command.

20 10. A method for processing storage data that is to be communicated over a network as recited in claim 1, wherein the STP transport protocol is configured to provide a stream of bytes arriving in the same order as they were sent.

11. A method for processing storage data that is to be communicated over a network as recited in claim 1, further comprising:

appending an IP header to each of the simple transport protocol data segments.

5        12. A method for processing storage data that is to be communicated over a network as recited in claim 1, wherein the storage data is selected from one of SCSI data, ATAPI data, and UDMA data

*Sub A<sup>2</sup>*  
13. A method for communicating storage data over an Ethernet network using

10      a non-TCP lightweight transport protocol, comprising:

providing data having a peripheral device protocol format, the data to be communicated over the Ethernet network;

selecting portions of the data;

attaching storage encapsulation (SEP) headers to the selected portions of the data;

15      attaching simple transport protocol (STP) headers to one or more of the selected portions having the SEP headers to produce STP packets; and

encapsulating the STP packets into Ethernet frames for communication over the Ethernet network.

*Sub b<sup>14</sup>*  
20      A method for communicating storage data over an Ethernet network using  
a non-TCP lightweight transport protocol as recited in claim 13, wherein the peripheral device protocol format is one of a SCSI format, an ATAPI format, and a UDMA format.

15. A method for communicating storage data over an Ethernet network using  
a non-TCP lightweight transport protocol as recited in claim 13, wherein the STP headers  
include at least a handle field, a type field, a length field, a sequence number field, and an  
5 acknowledgment field.

16. A method for communicating storage data over an Ethernet network using  
a non-TCP lightweight transport protocol as recited in claim 15, wherein the handle field  
is used to exchange a handle during the commencement of a session, the handle being  
10 exchanged between a initiator and a target of the network.

17. A method for communicating storage data over an Ethernet network using  
a non-TCP lightweight transport protocol as recited in claim 15, wherein the sequence  
number field is configured to count Ethernet frames.

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18. A method for communicating storage data over an Ethernet network using  
a non-TCP lightweight transport protocol as recited in claim 15, wherein the  
acknowledgment field is used to exchange positive and negative acknowledgments of  
transactions.

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19. A method for communicating data over an Ethernet network using a non-  
TCP lightweight transport protocol, comprising:

providing data having a virtual interface format, the data to be communicated over the Ethernet network;

selecting portions of the data;

attaching simple transport protocol (STP) headers to the selected portions of the

5 data to produce STP packets; and

encapsulating the STP packets into Ethernet frames for communication over the Ethernet network.

20. A method for communicating data over a network using a non-TCP

10 lightweight transport protocol, comprising:

providing data, the data to be communicated over the network;

selecting portions of the data;

attaching simple transport protocol (STP) headers to the selected portions of the data to produce STP packets; and

15 encapsulating the STP packets into frames for communication over the network.

21. A method for communicating data over a network using a non-TCP

lightweight transport protocol as recited in claim 20, wherein the data is one of storage data, network data, file data, and virtual interface data.

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22. A method for communicating data over a network using a non-TCP lightweight transport protocol as recited in claim 20, wherein the network is configured to communicate storage data.

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